GENERAL NOTES.

Members and friends of the Society are invited to aid the Committee on Publication in the work of this department. Communications to this end may be sent to FRANK SCHLESINGER, International Latitude Observatory, Ukiah, California.

Co-operation in Line-of-Sight Observations.—The number of astronomical enterprises calling for the co-operation of several observatories or observers is steadily increasing. The latest addition to the list relates to the determination of velocities in the line of sight with the spectroscope. It has been recognized for some time that observations of this kind may be subject to considerable systematic errors. In the case of variable velocity in the line of sight, for example, no safe conclusions can be drawn from the results given by different observers unless allowance is made for systematic differences. An obvious safeguard is for each observer to test his instrument by observing some body, like the Moon or the planets, whose velocity is well known in advance. Such tests have occasionally been made in the past by observers with the spectroscope, but perhaps not so often as would seem desirable. In other kinds of "observations of position," with the heliometer, for example, the observer who aims at the highest precision spends a considerable fraction *of each night* in controlling the adjustment of his instrument. Great care is no less necessary with the spectroscope, especially since experience has shown that an instrument ordinarily capable of determining velocities with a probable error well under one kilometer may, for one reason or another, occasionally become deranged so as to yield velocities ten kilometers in error.

Professor E. B. FROST, of the Yerkes Observatory, has just proposed a plan for the investigation of systematic errors which in all likelihood is destined to be of much importance in the history of the subject. The observatories at Potsdam, Poulkova, Meudon, Cape of Good Hope, Cambridge (England), the McMillin (Ohio), the Yerkes, and the Lick are represented in the scheme, so that all the observers at present engaged in this kind of work will take part. Ten stars, to be known as "fundamental velocity stars," are to be observed at least three times a year by each observer, and the results are to be promptly published, together with all collateral data. The selected stars are well distributed in Right Ascension and in Declination; they

range four magnitudes in brightness, and the spectral types also differ somewhat. Known spectroscopic binaries, with one exception, have been excluded from the list. This plan is regarded as a preliminary one. "It is to be hoped," writes the proposer, "that the experience of this simple plan of co-operation may be satisfactory enough to lead to its further development in the future."

The Parallax of the Sun from Spectroscopic Observations.—It is a fascinating thought that the parallax of the Sun can be determined by means of the spectroscope. In order to compute the linear velocity of the Earth in its orbit we must first know the distance of the Sun. Conversely, if we measure the Earth's velocity, we can compute the Sun's distance (and therefore its parallax) from the equation:—

The Sun's mean distance = the Earth's mean velocity × a constant.

This constant is known with extreme accuracy. Now, if any star near the zodiac be observed with the spectroscope at the two seasons when its longitude differs from that of the Sun by 90°, we can deduce not only the velocity of the star in the line of sight, but the mean velocity of the Earth in its orbit as well. These ideas have no doubt been entertained by spectroscopists ever since the practical demonstration of the soundness of DOPPLER'S principle, but they have not been put into effect because until quite recently it has not been possible to make the observations with sufficient accuracy. In connection with the plan of co-operation which is the subject of the preceding note, Sir DAVID GILL, Director of the Cape of Good Hope Observatory, has thrown out the suggestion that, "at each observatory some star should be selected to be observed nearly throughout the whole year, so as to determine the mean velocity of the Earth's motion independently by spectroscopic means—in other words, to determine the solar parallax by spectroscopic methods. This should give us a tolerably sound measurement of the fundamental accuracy of our work." It is to be hoped that this suggestion will be generally adopted. It is not impossible that the result of such observations would be valuable as a contribution to our knowledge of the Sun's distance as well as for the reason given by

Sir DAVID GILL. Two observations, taken at two opposite seasons, of a properly chosen star, will differ by as much as 59.7 kilometers per second on account of the Earth's motion. Several spectroscopes have at the present time reached or surpassed an accuracy corresponding to a probable error of half a kilometer for a single determination of a velocity. This means that in order to reduce the probable error of the Sun's parallax to 0".01 about two hundred observations would be necessary. As these observations would be distributed among several observatories, the expectation would perhaps not be unwarranted that systematic errors would not greatly influence the result, especially when it is remembered that the observations are *differential,* and that any error which is constant for a given star would not affect the result. Furthermore, special precautions like the following might be adopted for this work: (1) The star to be observed should have a longitude near six hours or eighteen hours in order that in the spring and in the fall its longitude will differ from that of the Sun by 90°. In this way observations at extreme temperatures may be avoided. (2) Without being too far from the zodiac the star should have such a declination as to pass near the zenith. (3) The star should have the best kind of spectrum for this work (SECCHI'S Type II). (4) As bright a star as possible should be chosen in order to make the exposures short. (5) The star should always be observed at nearly the same hour-angle, and therefore at nearly the same zenith-distance.

Change in the Spectrum of Nova Persei.—Nova Persei has steadily diminished in brightness, until now it is fainter than the ninth magnitude; that is, it emits less than the one four-thousandth part of its light at the height of its glory, in February, 1901. Ordinary spectroscopic observations upon such an object are, of course, extremely difficult, but Professor BARNARD of the Yerkes Observatory was able to show in a simple and ingenious way that the spectrum had undergone an important change toward the beginning of October. Up to that time repeated examinations of the focal-scale attached to the great 40-inch telescope showed no difference between the *Nova* and an ordinary star. But on October 6th, and some succeeding dates, Professor BARNARD found that the focal length was

five or six millimeters longer for the *Nova* than for other faint stars. At the same time he noted a change in color from white to bluish-white. Professor BARNARD was led to make these observations by his earlier work on planetary nebulæ, which the *Nova* much resembles. It was in their case that he first noticed a measurable difference in focus as compared with the majority of stars. The theory of this difference is quite simple, arising from the imperfect achromatism of the objective. If we should focus in succession upon luminous objects emitting monochromatic light, we should find a regular and gradual change in focal length as we pass from one color to its neighbor in the spectrum. Of course, such a change in focus is not appreciable in a small telescope. The Yerkes telescope has a focal length of 62 feet, and is therefore pre-eminently fit for such observations.

On November 29th, Comet 1902 *b* (PERRINE) passed within two million miles of *Mercury*. As the perturbation of the comet is comparatively great at such a small distance, it is not improbable that a thorough discussion of the comet's orbit will throw additional light on the question of *Mercury's* mass. This quantity is at present quite indeterminate, more so than the mass of any other planet. A change of twenty or thirty per cent from the usually adopted value is not impossible. Observations of this comet therefore assume unusual importance.

Dr. CARL W. WIRTZ has carried out an extensive triangulation of the *Hyades* with the six-inch heliometer at the Bonn Observatory. This instrument was made by MERZ and MAHLER sixty years ago. The triangulation includes sixty-nine stars and extends over the well-known V in *Taurus* and over an equal portion of the sky immediately south. The whole area included is about eighteen square degrees, and it is the greatest single area ever triangulated. The reason for extending the work to such limits is found in the community of proper motion which attaches to nearly all the stars in the region. Dr. WIRTZ's work will, after the lapse of some years, no doubt occupy the same relation to this group as BESSEL's work does to the *Pleiades,* or WINNECKE's to *Præsepe.*

Professor WILHELM FOERSTER, Director of the Royal Observatory at Berlin, announces his intention of retiring next year. He will, however, still retain his professorship in the university.

The authorities of Williams College, Williamstown, Mass., have named Professor MILHAM as successor to the late Professor SAFFORD in the directorship of the Field Memorial Observatory at that institution.

Dr. RUSSELL TRACY CRAWFORD has resigned his place in the Berkeley Astronomical Department of the University of California, to accept a position on the examining force of the United States Civil Service Commission.

A brother of Director VAN VLECK, of the Wesleyan University Observatory, at Middletown, Conn., has given the sum of $40,000 to the university for the erection of a new observatory.

ALEXANDER KOWALSKI, astronomer at the Poulkova Observatory, died on July 6th last, at the age of forty-four years. He was born at Kasan, where his father was director of the observatory of that city. ALEXANDER. KOWALSKI had been connected with the Kasan Observatory from 1882 to 1894, at which latter date he accepted a call to Poulkova. At Kasan he took part in the observations for the Astronomische Gesellschaft Catalogue of Stars (Zone 75° to 80°), in observations with the prime-vertical, and in the latitude-variation work. At Poulkova he was chiefly concerned with a new catalogue of 1000 stars which has just been completed. This catalogue is the first, we believe, to be based upon observations with the registering micrometer.
